● PRINTER RUSH ●
(PTO ASSISTANCE)

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[RUSH] MESSAGE: SPECIFICATION Page 4 Line 12; Page 8, Line 2; missing U.S. Pat. App. Ser. No.

Please Resolve.

THANK YOU
NRB

[XRUSH] RESPONSE: Corrected

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INITIALS: RB

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value for that field falls within the range specified by the rule.

Filter rules can interact based on the priority for the filter rule. Suppose that two filter rules are defined such that they intersect, where the first filter rule is an exception to the second filter rule. A packet matching the first filter rule would also match the second filter rule. A packet matching the second filter rule will not necessarily match the first filter rule. The second filter rule can be viewed as a default rule. In such a case, the first filter rule must be of higher priority than the second filter rule to ensure that when a packet matches both filter rules that the first filter rule dominates.

Figure 2 depicts a high-level flow chart of a conventional method 50 for determining which, if any, filter rules to enforce for a particular packet. The method 50 is described more fully in co-pending U.S. Patent Application Serial No. 09/312/148 entitled "System and Method and Computer Program for Filtering Using Tree Structure" (RAL919990006US4) filed on 10/19/1999 and assigned to the assignee of the present invention. Applicant hereby incorporates by reference the above-mentioned co-pending patent application. The method 50 is typically performed by the network processor 42. The possible filter rules which can match the key are narrowed to a set of remaining filter rules. This is done via step 52 which eliminates rules which cannot match the key. Step 52 can be accomplished using a decision tree. A decision tree contains nodes which perform a test, branches which indicate where in the decision tree to go based on the test, and leaves which correspond to some number of filter rules. At each node of the decision tree, a single bit of the key is tested. Based on the results of a test at a node, a different branch is taken. The branch can lead to another node or to a leaf. Each node thus

example be determined using a method described in co-pending U.S. Patent

Application Serial No. _09/540 333_ entitled System Method and Computer Program for

Prioritizing Filter Rules" (RAL919990048US1) filed on March 31, 2000 and assigned to

the assignee of the present application. Applicant hereby incorporates by reference the

above-mentioned co-pending patent application. The statistics indicate a frequency of

enforcement for each of the plurality of filter rules. The method and system also comprise

placing the plurality of filter rules in an order for testing against the key. The order is based

on the frequency of each filter rule of the portion of the plurality of filter rules.

The present invention will be described in terms of a particular network processor in

a switch. However, one of ordinary skill in the art will readily recognize that the method and

system operate effectively when used in a different network processor or for a network

processor in another component, such as a router. The present invention is also described in

the context of certain methods having particular steps. In addition, one of ordinary skill in

the art will readily realize that, for clarity, certain steps have been omitted. Thus, the method

and system in accordance with the present invention are consistent with other or additional

steps.

To more particularly illustrate the method and system in accordance with the present

invention, refer now to Figure 3, depicting one embodiment of a method 100 in accordance

with the present invention for ordering filter rules for testing of a key. The method 100 is

preferably used in a network processor, such as the network processor 42 of Figure 1B.

Consequently, the method 100 of Figure 3 will be described in conjunction with the network

1, the switch 10 and the network processor 42. However, one of ordinary skill in the art will

readily recognize that the method 100 is consistent with other components performing some